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AURORA PUMP A member of PENTAIR PUMP GROUP

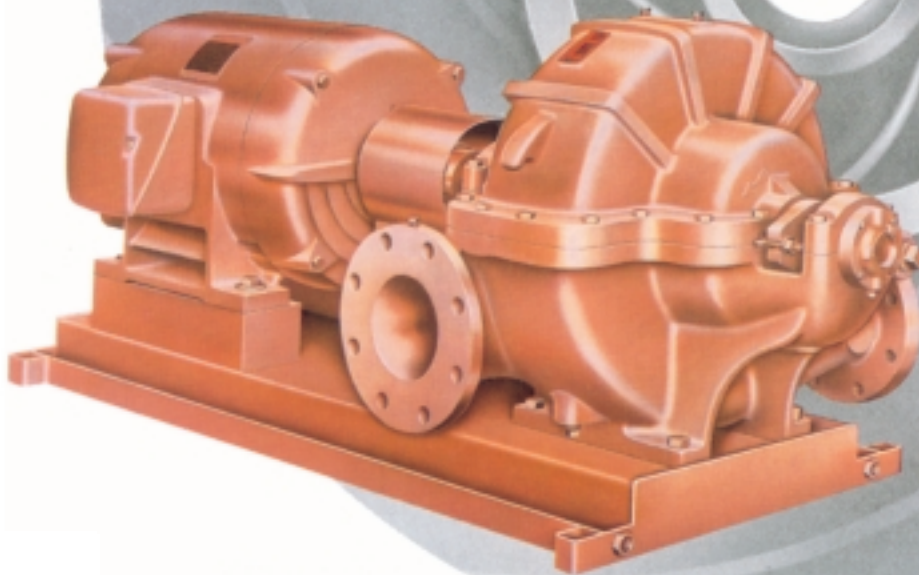
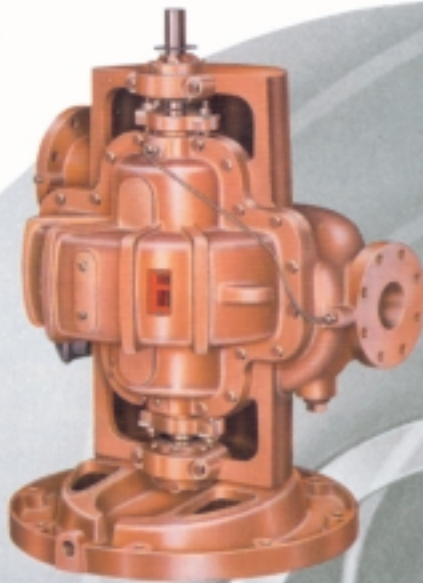
**AURORA PUMP**

BULLETIN 420/REV. H

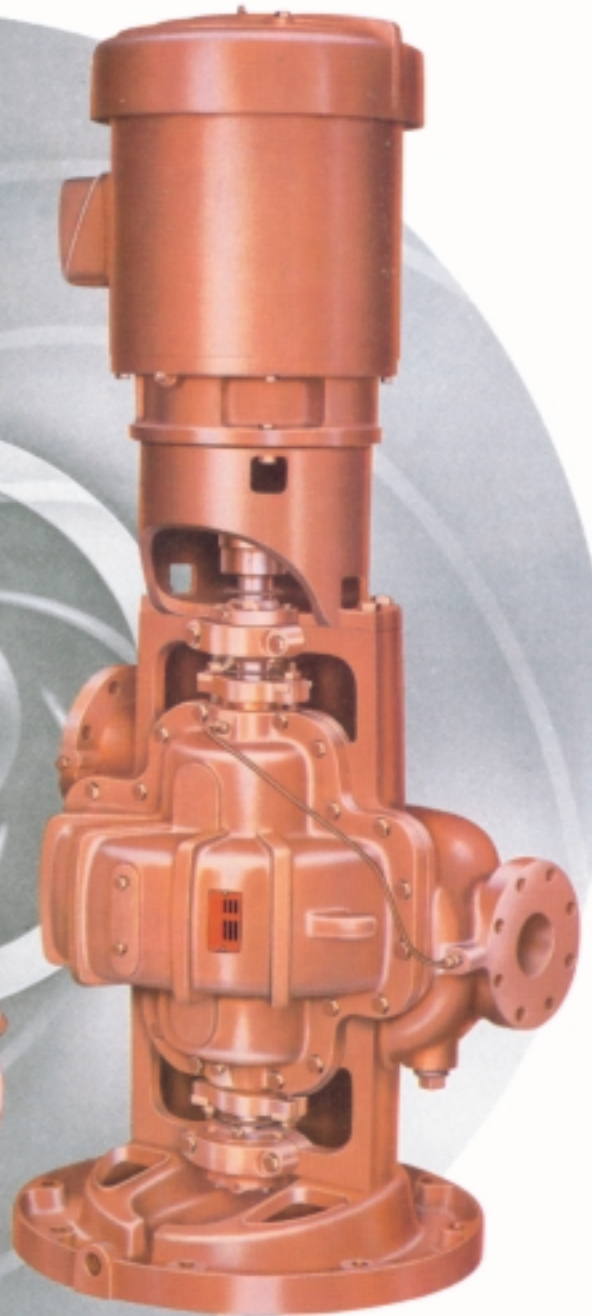
**420 SERIES  
MULTI-STAGE  
SPLIT CASE  
PUMPS**

CAPACITIES TO 1800 G.P.M.  
HEADS TO 600 FEET  
TEMPERATURES TO 275°F

MODEL 422



MODEL 421



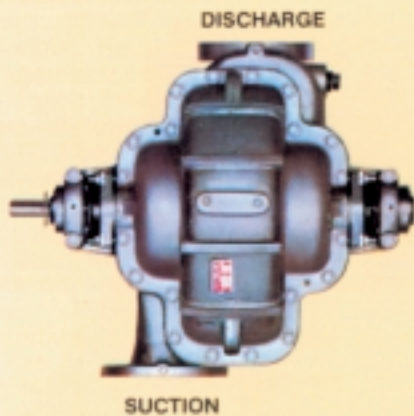
MODEL 423

## INTRODUCTION 420 SERIES PUMPS

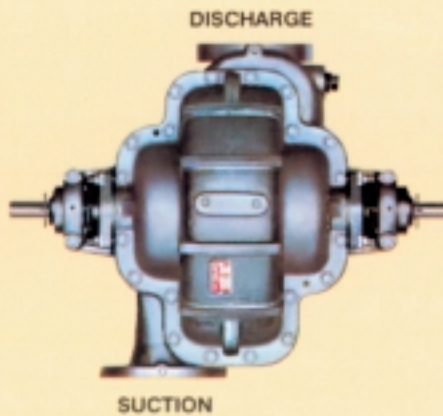
The horizontal split case pump has long and properly been used for the handling of liquids where the utmost in reliability and accessibility are paramount. Billions of gallons of liquid have been pumped by split case opposed suction pumps and billions more will be pumped con-

sidering the rapid industrial, agricultural and commercial expansion. The Aurora 420 Series pumps make a significant contribution to the customer requirements for pumps on this type of service. The 420 Series is a modern design based on Aurora Pump's 70 years experi-

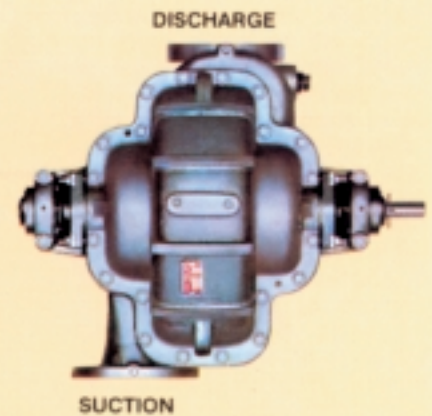
ence with the design, sales and manufacture of horizontal split case pumps. Look through this bulletin and see what real accomplishments can be made when an imaginative approach is taken to the customer's problem of moving liquids within a piping system. See Aurora now!



**STANDARD  
RIGHT HAND ROTATION**



**OPTIONAL DUAL DRIVE  
RIGHT HAND ROTATION**



**OPTIONAL  
LEFT HAND ROTATION**

### QUICK REFERENCE 420 SERIES FEATURE SELECTOR

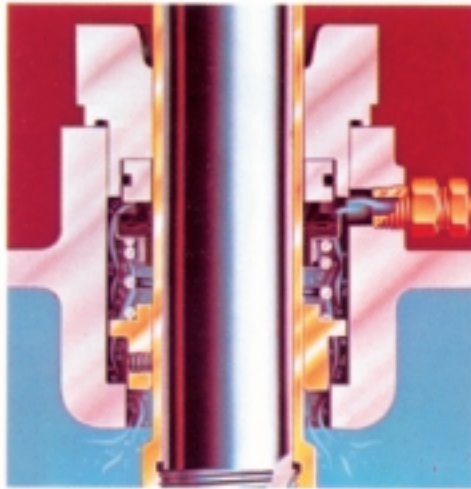
#### STANDARD

- Bronze fitted pump construction
- Bronze shaft sleeves
- Dynamically balanced impellers
- Bronze case wearing rings
- Multi-volute on 2" and larger pumps
- Stainless steel impeller key
- Regreaseable ball bearings
- Single row ball bearing (inboard)
- Double row ball bearing (outboard)
- Mechanical seals . . . single unbalanced (Model 422 and 423)
- Interwoven, graphite/Teflon lubricated acrylic yarn packing rings (Model 421)
- Internal bypass between casing and stuffing box (First Stage)
- 125# suct., 250# disch. ASA flanges
- 250 psi case working pressure
- Carbon steel shaft
- Stuffing box bushings
- Lifting lugs
- Hydrostatic test
- Cast integral bearing arms
- Water slingers and grease seals
- Coupling guard (Model 421)

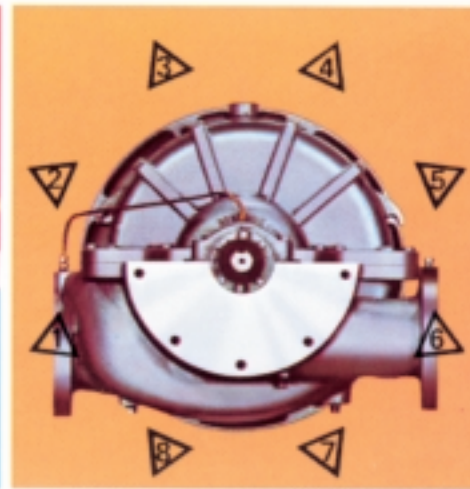
#### OPTIONAL

- All iron, all bronze or special alloy pump construction
- Hardened 440C stainless steel shaft sleeves (packing only)
- 316 stainless steel shaft sleeves (mechanical seal)
- Impeller wearing rings
- Oil lubricated ball bearings (model 421 horizontal pump)
- Mechanical seals . . . single unbalanced (Model 421)
- Stainless steel or monel shaft
- External bypass between casing and stuffing box
- Steel drip rim, formed steel or fabricated steel bases
- Double extended shaft (Model 421)
- Right or left hand rotation
- Certified performance test
- Packing with lantern ring (Model 421)
- 250# ASA suction & discharge flanges
- Water cooled bearings

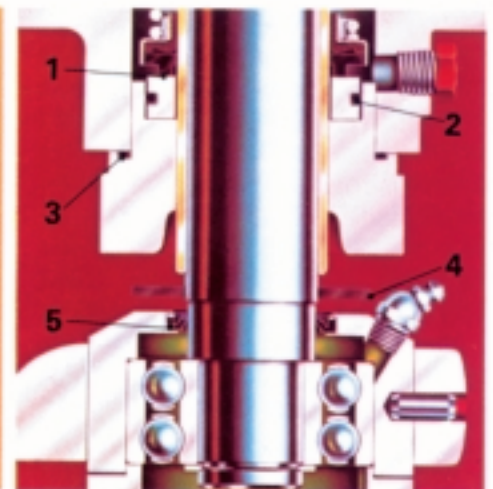
## VERTICAL PUMP FEATURES



EXTERNAL UPPER SEAL FLUSH



INLINE PIPING IN ANY DIRECTION



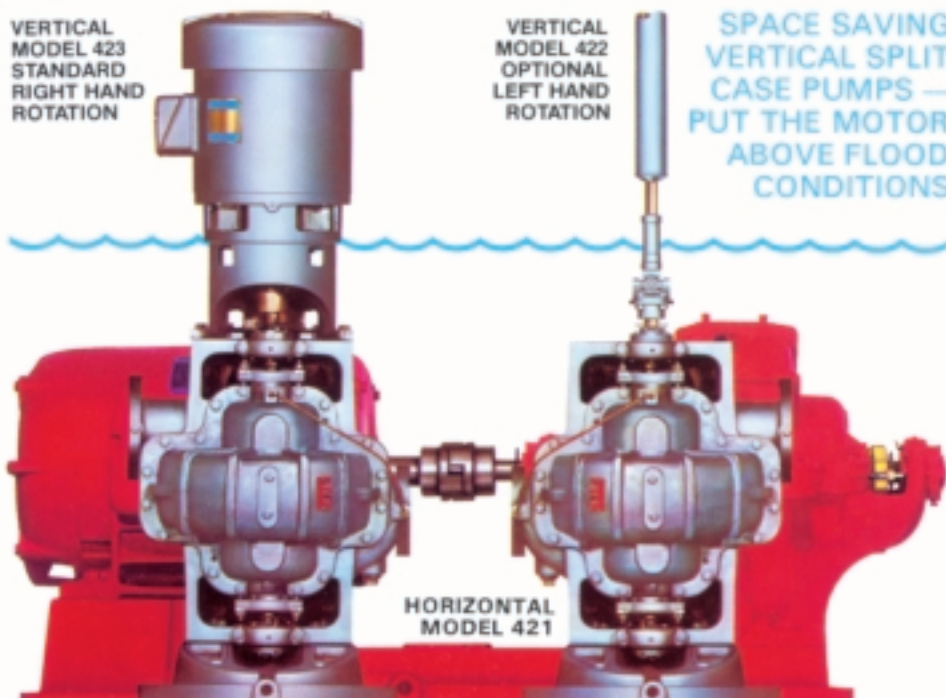
FIVE WAY BEARING PROTECTION

GO VERTICAL AND PUT 2 PUMPS WHERE ONLY ONE HORIZONTAL WOULD FIT. Aurora's space saving vertical split case pumps have long been recognized for their reliability. This reputation in the field of vertical installations has been re-emphasized since the introduction of the Model 423 as pumps of unmatched quality. VERTICAL PUMPS PROVIDE DISTINCT ADVANTAGES OVER HORIZONTAL PUMP CONSTRUCTION.

1. Less floor space required.
2. Inline piping arrangement al-

lows piping in any direction. 3. Elevated motor protects against potential flooding if the pump station is in a low area. Additional features described for the horizontal pumps are also found in the vertical pumps. In addition, there are several features unique only to verticals. **1 COUPLING ALIGNMENT** True alignment is vital to long life and proper performance. To maintain proper coupling alignment the mounting bracket is rabbet fitted to the motor. **2 MECHANICAL SEALS** Standard construction includes car-

bon against Ni-Resist face for optimum hot water performance. Long life is also assured with 303 stainless steel metal parts and "Buna-N" elastomers. **3 BEARING PROTECTION** Grease seals and water slingers are provided to protect the bearings from contamination. This important feature is also standard on horizontal pumps. **4 CAST IRON DRIP RIM BASE** Accurate positioning of the pump is assured by the mounting base. A drip rim is incorporated in the base design to control condensation and leakage.



VERTICAL  
MODEL 423  
STANDARD  
RIGHT HAND  
ROTATION

VERTICAL  
MODEL 422  
OPTIONAL  
LEFT HAND  
ROTATION

SPACE SAVING  
VERTICAL SPLIT  
CASE PUMPS —  
PUT THE MOTOR  
ABOVE FLOOD  
CONDITIONS

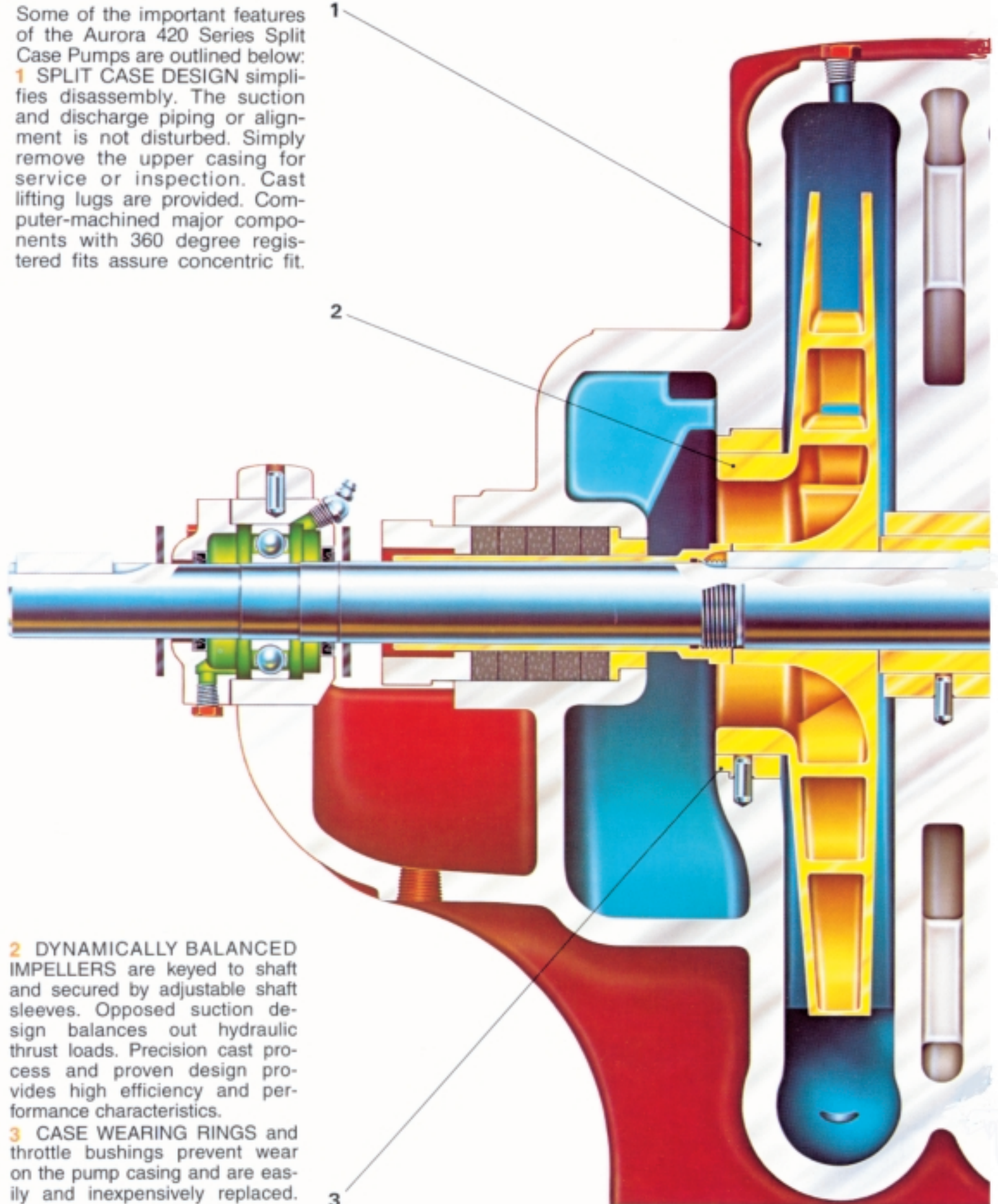
HORIZONTAL  
MODEL 421

MODELS 421 are horizontally baseplate mounted with a driver flexibly coupled to the pump. This design is recommended where floor space is readily available and where flooding of the installation is not possible. MODELS 422 are vertically mounted and utilize flexible shafting between the driver and the pump. This model is frequently used on difficult applications where flooding of the installation is a possibility. MODELS 423 are vertically mounted with an elevated driver coupled directly to the pump thru a flexible coupling. Model 423 is very popular for installations where available floor space is limited and where possible flooding is marginal.

## HORIZONTAL PUMPS

Some of the important features of the Aurora 420 Series Split Case Pumps are outlined below:

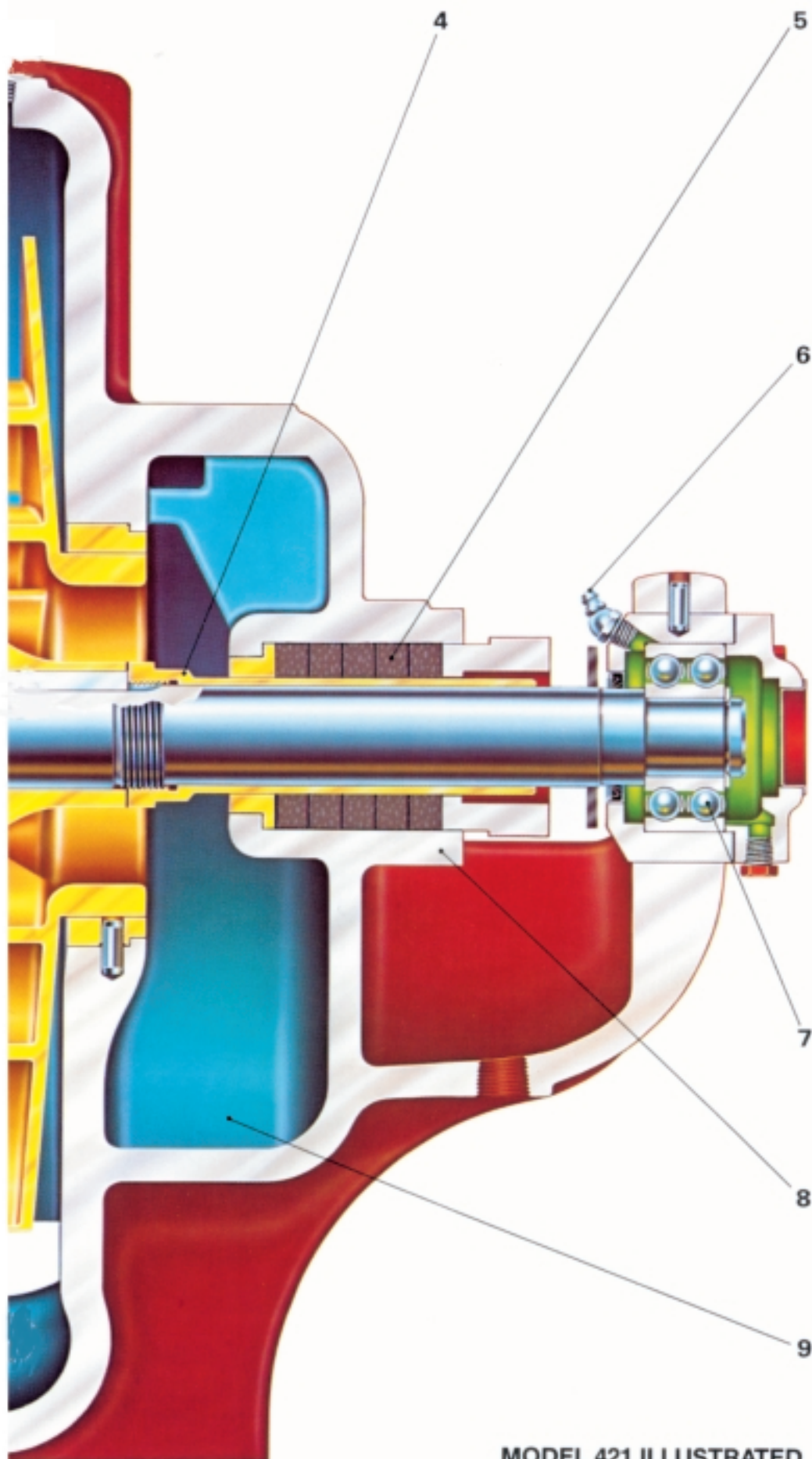
**1 SPLIT CASE DESIGN** simplifies disassembly. The suction and discharge piping or alignment is not disturbed. Simply remove the upper casing for service or inspection. Cast lifting lugs are provided. Computer-machined major components with 360 degree registered fits assure concentric fit.



**2 DYNAMICALLY BALANCED IMPELLERS** are keyed to shaft and secured by adjustable shaft sleeves. Opposed suction design balances out hydraulic thrust loads. Precision cast process and proven design provides high efficiency and performance characteristics.

**3 CASE WEARING RINGS** and throttle bushings prevent wear on the pump casing and are easily and inexpensively replaced.

## PUMP FEATURES



**4 BRONZE SHAFT SLEEVE** prevents shaft wear, is slip fit over the shaft, keylocked, and extends the entire length of each stuffing box. Shaft sleeves and impeller are "O" ring sealed to eliminate corrosion of the shaft by the pumped liquid. This eliminates the need for high cost, special stainless steel or monel shafts.

**5 INTERCHANGEABLE STUFFING BOX** for mechanical seals or packing. Packing is standard on horizontal pumps. Optional lantern ring has an internal water seal passage between the casing and stuffing box and cannot be damaged. Mechanical seals have carbon against Ni-Resist face. Long life is assured with 303 stainless steel metal parts and "Buna-N" elastomers. Several optional mechanical seals are available.

**6 GREASE LUBRICATION** purges old grease from bearings. Oil lubrication is optional on horizontal pumps. Lube fittings are conveniently located for quick accessibility and provide positive bearing lubrication. Oil seals and non-sparking Neoprene rotating slingers protect both bearings during pump operation and washdowns.

**7 BEARINGS** selected for 50,000 hour minimum life at maximum load. Average bearing life 5 x minimum. Double row thrust ball bearing is standard on all models. Short bearing span holds shaft deflection to .002" at face of stuffing box at maximum load. Integral bearing arms eliminate bearing misalignment and simplify service.



**8 LEFT HAND ROTATION** can be readily provided with standard parts. Tandem drive pumps require only a different shaft.

**9 CERTIFIED PERFORMANCE** with **POSITIVE SUCTION PRESSURE** or with a **SUCTION LIFT** are available on each pump for customer approval. Pumps are all hydrostatically tested.

**MODEL 421 ILLUSTRATED**

\*E.I. DuPont Registered Trademark

# 420 SERIES RANGE CHARTS

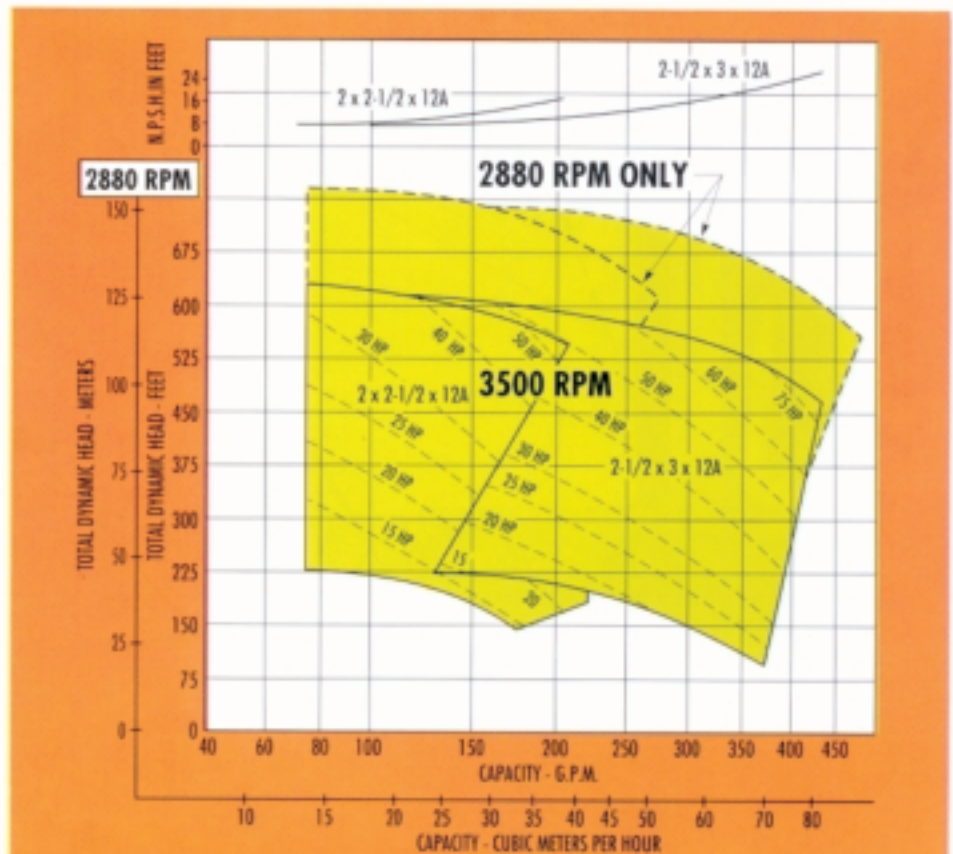
**FIRE PUMPS APPROVED BY  AND LISTED BY  FOR FIRE SERVICE**

HORIZONTAL split case pumps are the most common type of Fire Pump. These pumps are specially tested for fire-service applications where reliability of performance is of vital importance. They are characterized by easy access to all working parts, rugged construction, liberal water passages, and efficient operation. They are specified when the source of water is located above the surface of the ground and will provide a positive suction pressure to the pump at any performance point.

AURORA MEETS ALL OF THE REQUIREMENTS FOR FIRE PUMP SERVICE WITH ITS STANDARD PRODUCTION PUMPS. Therefore, to the Fire Pump user this feature means:

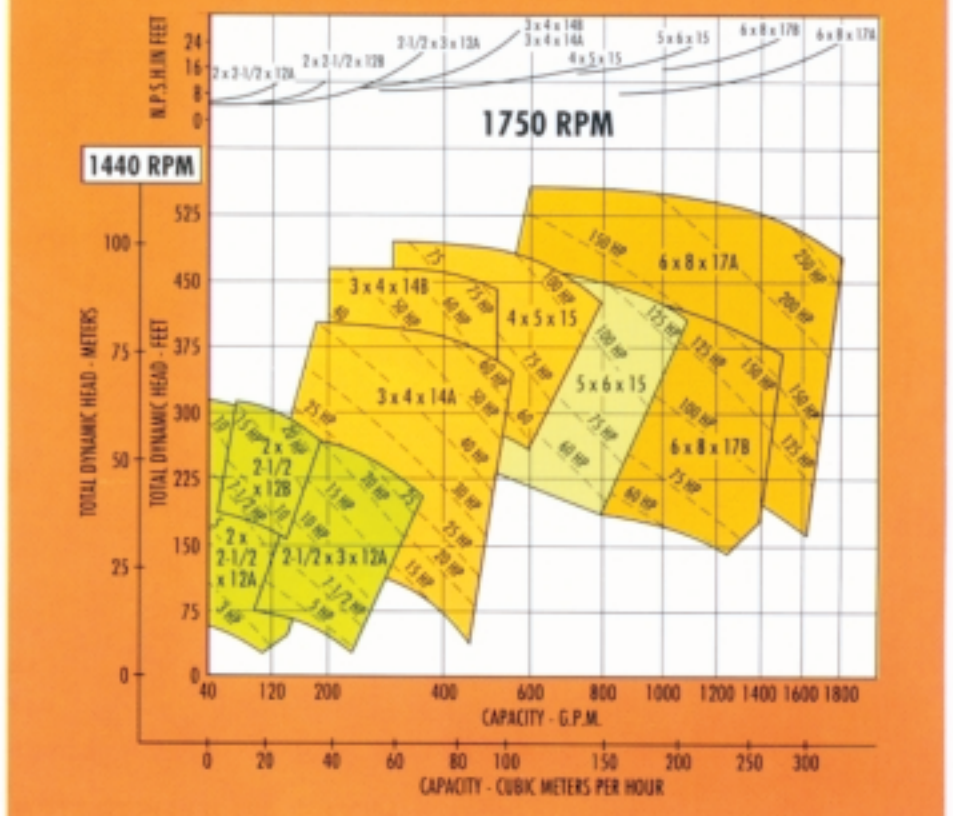
1. Lower initial cost.
2. Quicker delivery from stock.
3. Parts interchangeability with Aurora pumps specified elsewhere in your building reduces spare parts inventory and simplifies maintenance. The fact that Aurora pumps meet the rigid requirements of Underwriters' Laboratories and Factory Mutual Engineering is testimonial to the high quality of Aurora Pump products. Aurora Pump offers the only complete line of VERTICAL SPLIT CASE Double Suction type pumps approved and listed for fire-service. Vertical Fire Pumps provide distinct advantages over horizontal pump constructions.

1. Less floor space required.
  2. Inline piping arrangement allows piping in any direction.
  3. Elevated motor protects against potential flooding if the pump station is in a low area.
  4. Components are register fitted to prevent misalignment.
- If additional information is required, refer to Aurora Fire Pump Bulletin 900 for details.



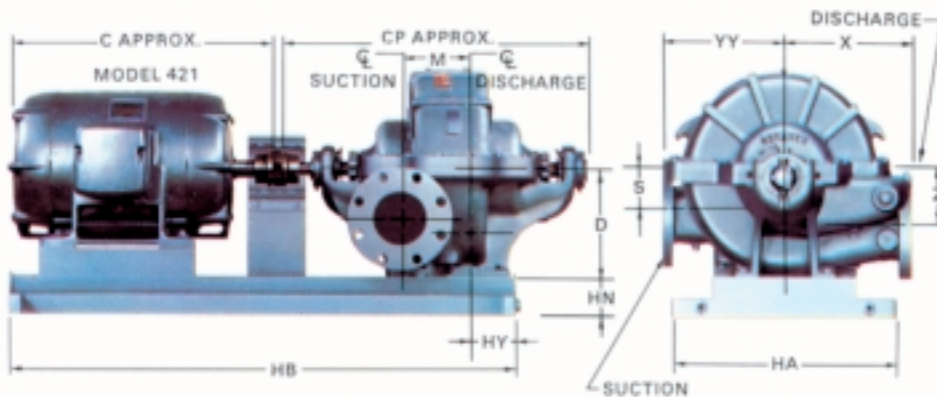
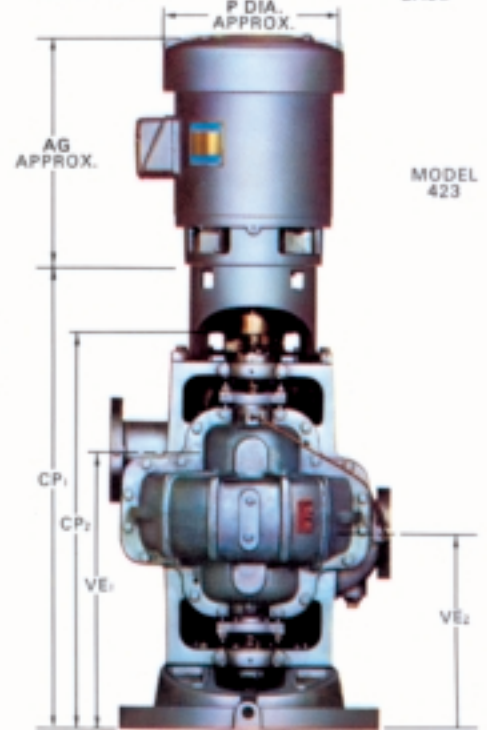
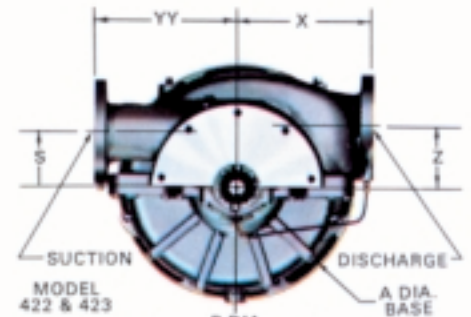
Individual performance curves For selections not shown refer to must be used for final selections. the factory or catalog sec. 420.

-  POWER SERIES NO. 2
-  POWER SERIES NO. 3
-  POWER SERIES NO. 4
-  POWER SERIES NO. 5



# PUMP DIMENSIONS

PUMP SIZE			P. SERIES	PUMP WGT. (LBS.)		A	D	M	S	X	Z	CP	HY	VE <sub>1</sub>	VE <sub>2</sub>	YY
DISCH.	SUCT.	BORSE		421	423											
2	2 1/2	12	2	270	360	18	9	4 1/4	4	10	5 1/2	26	5 1/4	17 1/4	12 1/4	10 1/4
2 1/2	3	12	2	290	400	18	9	5 1/4	4	11	5 1/2	26	5 1/4	18 1/4	12 1/4	11
3	4	14	3	480	610	22	10	6 1/4	4 1/2	12	6	31	5 1/4	21 1/4	14 1/4	12 1/4
4	5	15	3	570	NOT AVAIL.	11	7 1/4	5	13	6 1/2	31	5 1/4	—	—	—	13 1/4
5	6	15	4	790	NOT AVAIL.	12 1/2	9 1/4	5 1/2	15	7 1/4	35	6 1/4	—	—	—	15 1/4
6	8	17	5	1030	NOT AVAIL.	14 1/2	11	7	16	9	38	5 1/4	—	—	—	16 1/4
<b>MODEL 422 AND 423</b>																
POWER SERIES						2		3		4		5				
CP <sub>1</sub>				UP TO 256 HP		32		37		—		—				
CP <sub>2</sub>				284 HP & UP		34		40		—		—				
CP <sub>1</sub>						29		34		—		—				



NOTES: Apply to all Models.

\*\*Always use largest of 2 "D" dimensions.

†For motor and baseplate dimensions over 200 HP refer to the factory.

1. Dimensions and weights are approximate. 2. Complete dimensions are available. 3. Not for construction purposes unless certified for approval. 4.

Frame sizes shown are for open drip proof motors only. 5. Add pump, base and motor weight for unit weight total. 6. Conduit box is shown in approximate position. Dimensions are not specified as they vary with each motor manufacturer. 7. Aurora Pump reserves the right to make revisions to its products and their specifications, and to this bulletin and related information without notice.

MOTOR FRAME	MODEL 423	143 HP	145 HP	182 HP	184 HP	213 HP	215 HP	254 HP	256 HP	284 HP	286 HP	286 HP	324 HP	324 HP	326 HP	326 HP	364 HP	364 HP	365 HP	365 HP	404 HP	404 HP	405 HP	405 HP	444 HP	444 HP	445 HP	445 HP	
	MODEL 421	143 T	145 T	182 T	184 T	213 T	215 T	254 T	256 T	284 T	286 T	286 T	324 T	324 T	326 T	326 T	364 T	364 T	365 T	365 T	404 TS	404 T	405 T	405 T	444 TS	444 T	445 TS	445 T	
HORSE POWER	HP	3500	1 1/2	2-3	5	7 1/2	10	15	20	25	30	—	40	—	50	—	60	—	75	—	100	—	125	—	150	—	200†	—	—
	RPM	1750	1	1 1/2	3	5	7 1/2	10	15	20	—	25	—	30	—	40	—	50	60	—	75	—	100	—	125	—	150	—	200†
	MODEL	1150	—	1	1 1/2	2	3	5	7 1/2	10	—	15	—	20	—	25	—	30	—	40	—	50	—	60	—	75	—	100	—
MOTOR WEIGHT	MODEL 421	40	45	72	80	130	145	220	240	330	330	370	370	475	475	525	525	630	630	690	690	830	830	915	915	1095	1095	1270	1270
	MODEL 423	43	48	84	102	132	156	300	300	420	420	420	570	570	570	570	950	950	950	950	1230	1230	1230	1230	1680	1680	1680	1680	
C		12	13	13	14	16	18	21	23	22	24	24	25	25	26	26	28	27	29	28	30	30	33	31	34	34	38	36	40
D**		3 1/2	3 1/2	4 1/4	4 1/4	5 1/4	5 1/4	6 1/4	6 1/4	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	11	11	11	11	
P APPROX.		8	8	10	10	11	11	13	13	16	16	16	16	18	18	18	18	20	20	20	20	22	22	22	22	26	26	26	
AG APPROX.		11	12	14	15	18	17	20	21	22	22	23	23	25	25	26	26	25	25	25	25	28	28	28	28	32	30	32	

PUMP SIZE		MODEL 421 BASE NUMBER																												
PUMP SIZE	Power Ser. Mod. 421	2 x 2 1/2 x 12	3	3	5	6	8	8	8	9	9	9	11	11	11	11	11	12	12	12	12	12	12	12	12	12	12	12	12	
		2 1/2 x 3 x 12	3	3	5	6	8	8	8	9	9	9	11	11	11	11	11	12	12	12	12	12	12	12	12	12	12	12	12	12
		3 x 4 x 14			6	9	9	9	9	9	9	9	12	12	12	12	12	12	12	12	12	12	12	12	15	16	15			
		4 x 5 x 15					9	9	9	9	9	9	12	12	12	12	12	12	12	12	12	12	12	12	15	16	16	16	16	16
		5 x 6 x 15											12	12	12	12	12	12	12	12	12	12	12	16	16	16	16	16	16	16
6 x 8 x 17											10	10	10	10	12	13	13	13	13	13	13	16	16	16	16	16	16	16	17	
BASE		3	5	6	8	9	10	11	12	13	15	16	17	FLANGES — ASA STD.						FURNISHED AS:										
BASE WEIGHT		49	59	68	96	109	128	164	192	235	291	344	339	250K WITH 125K DRILLING (SUCT.) 250K DRILLING (DISCH.)						STANDARD										
HA		15	17 1/4	17 1/4	20 1/4	20 1/4	20 1/4	26 1/4	26 1/4	26 1/4	30 1/4	30 1/4	30 1/4	250K WITH 250K DRILLING						OPTIONAL										
HB		33 1/2	36 1/2	42 1/2	42 1/2	48 1/2	56 1/2	66 1/2	66 1/2	66 1/2	84 1/2	84 1/2	74 1/2																	
HN		3	3	3	3	3	3	4	4	4	4 1/2	4 1/2	4 1/2																	

## ENGINEERING SPECIFICATIONS

**MODEL 421, 422 and 423 HORIZONTAL SPLIT CASE** – Furnish and install as shown on the plans ..... Right hand (Left hand) Aurora Model (Horizontal-421) (Vertical-422 Open Shaft) (Vertical-423 Flexible Coupled) type Split-Case, Opposed Suction, Multi-Stage centrifugal pump, Size ..... x ..... x ..... of bronze fitted (all bronze) (all iron) (stainless steel) construction. The pump shall be capable of delivering at design conditions a capacity of ..... G.P.M. when operating against a Total Dynamic Head of .... feet, with a temperature of ..... °F, specific gravity ..... Pump shall have minimum guaranteed efficiency at design capacity of ..... %. Pump must also be capable of delivering a maximum of .... G.P.M. when operating against a head of ..... feet, and at this condition shall have a minimum efficiency of ..... %. Minimum shut off head acceptable will be .... feet. Pump shall operate at a maximum synchronous speed of .... R.P.M. A unit operating at a lesser rotative speed will be considered, but in no event will a pump operating at more than the maximum speed specified be acceptable. The pump casing halves will be constructed of "CLASS 30 CAST IRON," C.I. having a minimum tensile strength of 30,000 psi. and shall be of sufficient thickness to withstand stresses and strains at full operating pressures. Casings shall be subject to a hydrostatic pressure test at 150% of the specified duty point. Bearing housing supports, suction and discharge flanges shall be integrally cast with the lower half of the casing. Removal of the upper half of the casing must allow the rotating element to be removed without disconnecting the suction and discharge piping. The upper casing is to be dowel aligned to the lower casing. Pump sizes 2" and larger are to be of the multi-volute design. Drain openings must be provided in the bearing arms for removal of lubricating liquid. Impellers shall be of the enclosed, opposed, suction type and shall be of precision cast bronze (.....). Impellers shall be dynamically balanced and securely

fastened to the shaft by key and screw locked shaft sleeves. The vanes shall be designed to reduce noise. The pump shaft shall be made of high grade SAE 1045 Steel or equal, accurately machined to give a true running rotating element. The minimum dia. acceptable will be .....". The shaft shall be protected from wear by bronze (.....) sleeves which are key locked and threaded so that the sleeves tighten with the rotation of the shaft. Nitrile "O" rings must be provided between the impeller hub and the shaft sleeves to prevent pumped liquid from corroding the shaft. Pump shall be equipped with easily renewable bronze (.....) casing rings (impeller wearing rings) so designed that hydraulic pressure will seat them against a shoulder in the pump case around the full periphery of the wearing ring. The wear rings will be locked in place by doweling to prevent rotation. The rotating element shall be mounted in heavy duty grease lubricated ball bearings and shall be equipped with water slingers on side next to pump glands. Bearing housings shall be so designed to flush lubricant through and provide continuous cleaning of bearing surfaces and maximum protection against overheating. The pump shall be supplied with a single row inboard bearing primarily for radial loads and a double row outboard bearing primarily for thrust loads. Both bearings shall be regreaseable lubrication ball type, designed for 250,000 hours average life. Each bearing shall be mounted in a machined housing that is moisture and dust proof. The housing shall have registered fits to assure alignment, pinned to prevent rotation, and bolted to the bearing arms. Each housing shall be supplied with a grease fitting and a plugged relief port. **MODEL 421** – Stuffing boxes shall be placed on both sides of the pump centerline to seal the pump shaft. All packed pumps having a suction lift shall have a 1st stage lantern ring connected to the pressure side of the pump by a cored passage in the parting flange of the pump. The stuffing boxes shall be equipped with

heavy, cast, split glands with extra length, for easy removal for packing inspection and maintenance. Pump and motor shall be mounted on a common heavy base plate of (steel drip rim) (formed steel) (structural steel). Pump and motor must be checked for alignment after the pump base has been installed and grouted in place, in accordance with the standards of the Hydraulic Institute. There shall be no strain transmitted to the pumps. **MODEL 422 AND 423** – Mechanical seal boxes shall be placed on both sides of the pump centerline to seal the pump shaft. Each pump is to be furnished with mech. seals with all metal parts to be 303 stainless steel with "Buna-N" elastomers, Ni-Resist seat, and carbon washer. A bypass line must be provided for the upper seal between the seal faces and the discharge flange to assure adequate venting of the seal chamber and to provide lubrication. All pumps shall be provided with a cored passage in the parting flange of the pump to provide additional circ. to 1st stage seal. The mech. seal boxes shall be equipped with heavy, cast, one piece, "O" ring sealed glands. The pump shall be supported by a cast iron drip rim base. **MODEL 422** – Vertical open shaft pumps are to be driven through flexible shafting with .... dia. tubing, and intermediate bearings. Shafting must be of sufficient size to transmit required H.P. and must be provided with a slip spline which will permit removal of the pump rotating assembly without removing any section of intermediate shafting, bearings, suction or discharge piping. **MODEL 423** – Vertical flexible coupled pumps shall be furnished with a cast iron motor bracket which is to be bolted to the vertical casing. The motor bracket must be machined with a register fit to insure proper alignment of motor and pump shaft. **MODEL 421 AND 423** – The pumps shall be flexible coupled to a standard (horizontal) (vertical) NEMA ..... HP ..... phase ..... Hertz ..... volts ..... RPM (drip-proof) (tot. encl.) (explosion-proof) motor.

**NOTE:** Aurora Pump reserves the right to make revisions to its products and their specifications, and to this bulletin and related information, without notice.

— Your Authorized Local Distributor —

**WEMA**



**ap AURORA**  
Pump Pump Group

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800 AIRPORT ROAD • NORTH AURORA, ILLINOIS U.S.A. • 60542  
PHONE: (630) 859-7000 U.S.A./CANADA FAX: (630) 859-7060  
WORLDWIDE FAX: (630) 859-1226

WEB: [www.aurorapump.com](http://www.aurorapump.com)  
EMAIL: [aurora\\_info@pentairpump.com](mailto:aurora_info@pentairpump.com)

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